ENERGY ENGINEERING & MICROCOMPUTER APPLICATIONS **ENERCOMP, Inc.**

1721 Arroyo Drive • Auburn, CA 95603-9431
530-885-9890 • fax 885-9892 • email info@micropas.com

Re: **MICROPAS6 for the 2001 Standards**

Dear **MICROPAS6 Inquiry**:

Enercomp is the author of the market leading software, MICROPAS. Our current version, MICROPAS6, was the approved by the California Energy Commission in 2001.

Why should you be using MICROPAS6? There are many reasons. Are you no longer able to do calculations by hand? Tired of using poorly supported, poorly documented and/or incomplete software? Whatever you are currently using, does it:

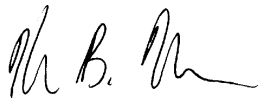
- Include the **computer performance** method and **HVAC sizing** calculations all in one package?
- Include **toll free support** with questions answered by the authors of the software and documentation at any time during regular business hours?
- Focus on doing one thing -- giving your **residential** buildings the best possible compliance results?
- Run on **virtually any computer** from the oldest to the newest?
- Include support for all of the minimum and optional capabilities, plus special features to handle **additions, subdivisions** and more?
- Include documentation **written by practicing Title-24 experts** with help on how to do Title-24 calculations, not just how to use the software?
- Include one year of **free updates** to protect your investment?
- Include a **45 day money back guarantee** if you are not satisfied?

We already know the answer – MICROPAS6 is the only package available to include all of these features and more.

The full version of MICROPAS6 is now available at the price of $795 plus tax and shipping. We ship MICROPAS after receiving your payment and we can take credit card orders over the phone.

Thank you for your interest in MICROPAS6. We hope that the enclosed product literature answers most of your questions about the program. If not, please don't hesitate to call. Our toll free number is 800-755-5908.

Sincerely,



Ken Nittler, P.E.
Enercomp, Inc.

MICROPAS Support Policy

- **One year of free updates**. This protects your investment from changes in the software or standards for one year from the date of original purchase. Mailing and handling costs not included.
- **One year of unlimited technical support**. We are here to make sure that you get the most out of your MICROPAS purchase. Our toll free number is 800-755-5908.
- **45 day money back guarantee**. If the software doesn't meet your needs, you have 45 days to return it for a full refund.

"MICROPAS...is the most widely used computer compliance program in California"
Committee Report, Commissioner Art S. Kevorkian Presiding Member, California Energy Commission

Any Questions? Call us at 800-755-5908 or visit our web site at http://www.micropas.com

Demo!

Enercomp thanks you for your interest in the MICROPAS program. Enclosed is your free demo version. This demonstration version is the same as our full working version except that the building size is restricted to 1600 sqft in one California climate zone and our comprehensive User's Manual is not included.

The purpose of this demo version is to give you an idea of how the program operates and to verify that it works on your computer. If you are interested in the details of how to use MICROPAS for actual compliance work, you might want to attend one of our seminars. Or, better yet, go ahead and buy MICROPAS with our money back guarantee. You then have 45 days to try the software risk free. If you are not satisfied that MICROPAS is right for you, you may return it for a full refund.

WINDOWS 95/98/ME/NT/2000 INSTALLATION INSTRUCTIONS

1. Place disk in your floppy drive.
2. Press the Start button in Windows.
3. In the Run dialog box, enter:

   A:\INSTALL (or B:\INSTALL)

4. To complete installation, restart Windows.

DOS INSTALLATION INSTRUCTIONS

1. Place disk in your floppy drive. Log onto this drive by entering the drive name (A, B, etc.) followed by a colon. Example DOS command:

   A:

2. Start the installation procedure. Example DOS command:

   INSTALL

3. Start the program. Example DOS command:

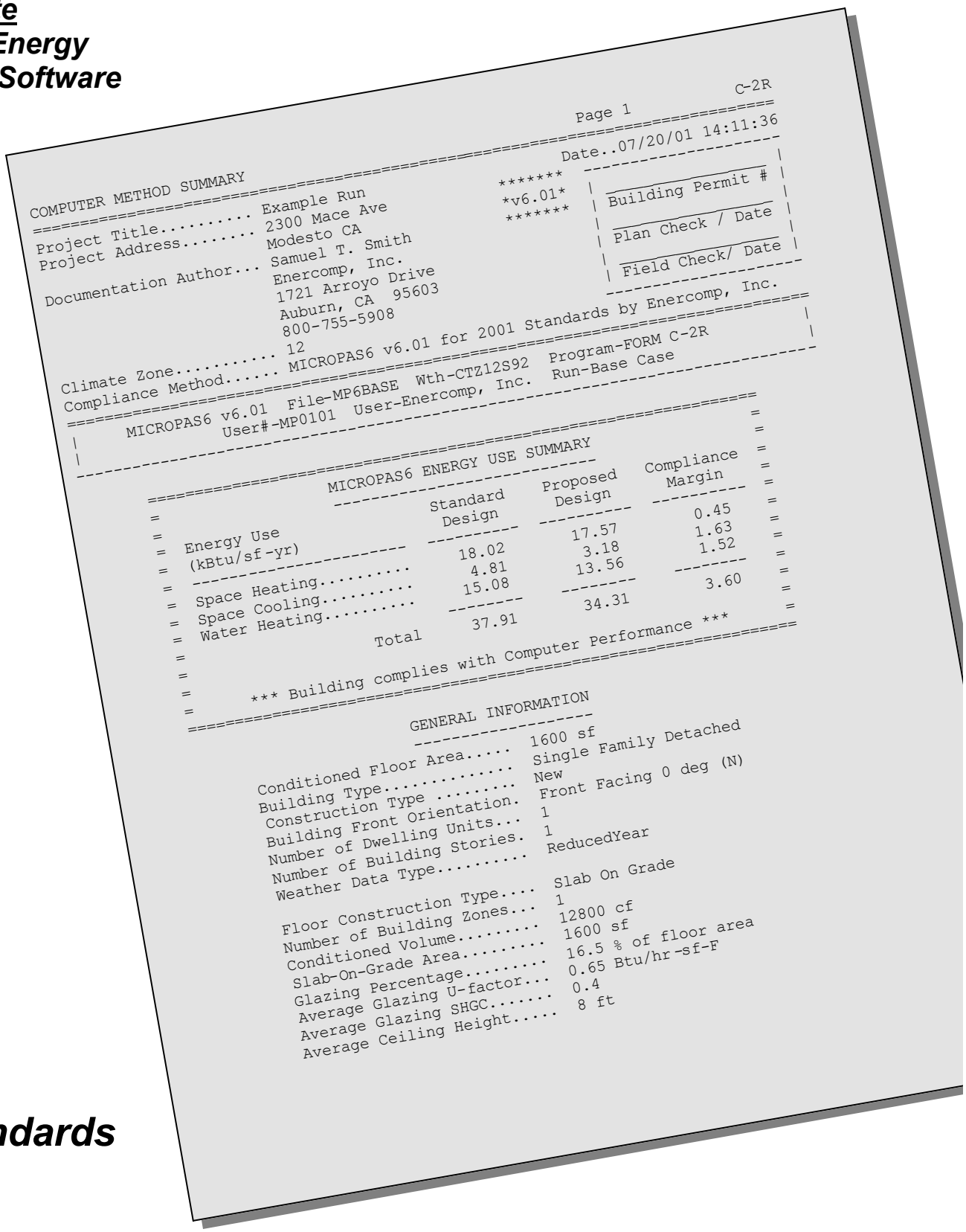
   MP60

An important part of our products is our technical support, so please don't hesitate to call if there are any questions or problems.

Any Questions? Call us at 800-755-5908

MICROPAS6

The Complete Residential Energy Compliance Software Solution



```
                                                                    C-2R
                                                          Page 1
COMPUTER METHOD SUMMARY                                          Date..07/20/01 14:11:36
=======================                                   *******  ------------------
Project Title..... Example Run                            *v6.01*  | _____________ |
Project Address..... 2300 Mace Ave                        *******  | Building Permit # |
                     Modesto CA                                    | _____________ |
Documentation Author... Samuel T. Smith                            | Plan Check / Date |
                        Enercomp, Inc.                             | _____________ |
                        1721 Arroyo Drive                          | Field Check/ Date |
                        Auburn, CA  95603                          ------------------
                        800-755-5908
Climate Zone..... 12
Compliance Method..... MICROPAS6 v6.01 for 2001 Standards by Enercomp, Inc.
=============================================================================
|      MICROPAS6 v6.01  File-MP6BASE  Wth-CTZ12S92  Program-FORM C-2R       |
|      User#-MP0101  User-Enercomp, Inc.  Run-Base Case                     |
-----------------------------------------------------------------------------

=============================================================
=                                                           =
=                  MICROPAS6 ENERGY USE SUMMARY             =
=                  ----------------------------             =
=                    Standard    Proposed    Compliance     =
=                     Design      Design      Margin        =
=  Energy Use       ----------  ----------  ----------     =
=  (kBtu/sf-yr)                                            =
=  ----------------  ----------  ----------  ----------     =
=  Space Heating.....    18.02       17.57        0.45      =
=  Space Cooling.....     4.81        3.18        1.63      =
=  Water Heating.....    15.08       13.56        1.52      =
=                        -------     -------     --------   =
=  Total                 37.91       34.31        3.60      =
=                                                           =
=                                                           =
=      *** Building complies with Computer Performance ***  =
=============================================================

                    GENERAL INFORMATION
                    -------------------
Conditioned Floor Area.....  1600 sf
Building Type.............   Single Family Detached
Construction Type .........  New
Building Front Orientation.  Front Facing 0 deg (N)
Number of Dwelling Units...  1
Number of Building Stories.  1
Weather Data Type.........   ReducedYear

Floor Construction Type....  Slab On Grade
Number of Building Zones...  1
Conditioned Volume.........  12800 cf
Slab-On-Grade Area.........  1600 sf
Glazing Percentage.........  16.5 % of floor area
Average Glazing U-factor...  0.65 Btu/hr-sf-F
Average Glazing SHGC.......  0.4
Average Ceiling Height.....  8 ft
```

Version 6 for the 2001 Standards

ENERCOMP, Inc.

1721 Arroyo Drive ▪ Auburn, CA 95603 ▪ 800-755-5908 ▪ fax 530-885-9892 ▪ www.micropas.com

RESIDENTIAL BUILDING ENERGY STANDARDS (TITLE-24)

All new homes built in California must meet a high level of energy efficiency, as required by the *Residential Energy Efficiency Standards*. These standards provide a choice of two methods to show compliance:

- *Prescriptive Packages* (inflexible, seldom used).
- *Computer Performance* (most compliance flexibility, most popular method).

The MICROPAS software package shows compliance with the *Computer Performance* method. The California Energy Commission (CEC) has specifically approved MICROPAS for showing compliance with the standards.

WHY USE COMPLIANCE SOFTWARE?

- Fast and easy to make design trade-offs.
- Get credit for building features that aren't accounted for in the *Prescriptive Packages*.
- Model the features that are the most economical for your project.
- Allows you to take full advantage of energy conserving features and arrive at the most cost effective building design.
- Compliance software is used in most building submittals statewide.

WHY MICROPAS?

MICROPAS is the most popular compliance program in use today . . . more compliance submittals are being made with MICROPAS than any other compliance program.

The popularity of MICROPAS is simple. It is the result of word-of-mouth referrals by our many satisfied customers based on:

- The features MICROPAS offers.
- The user support Enercomp provides with the purchase.
- The value MICROPAS gives to a compliance oriented business.

USER SUPPORT

Providing you unsurpassed support continues to be a priority at Enercomp, as it has for over 18 years. Some of our support services include:

- One year of free, unlimited technical phone support from Enercomp -- experts in the operation of MICROPAS and in the details of Title-24 compliance issues.
- A Toll Free support hotline to ensure that your questions are answered promptly.
- Software updates provided free for a year. Protects your software investment.
- Notification of changes in the Title-24 energy standards that affect your use of MICROPAS.

MICROPAS AS A BUSINESS

Hundreds of energy consulting firms statewide rely on MICROPAS consulting as their primary source of income. Why?

- You get technical phone support during business hours to resolve your problems quickly.
- Our software is designed to give you and your client the most design flexibility, while minimizing your compliance effort.
- You can rely on Enercomp to update MICROPAS when the CEC changes the energy standards. We provide updates on-time and as-promised.

WHAT INDUSTRY SAYS

"At last count approximately 95% of our members are using the Performance Approach. In particular, the MICROPAS program. MICROPAS is used the overwhelming majority of the time."
Robert Raymer, Technical Director
California Building Industry Association

"I would like to extend my personal gratitude to you and your company for the dedication and commitment made to develop MICROPAS. This program helps support the residential standards and meet a Commission objective of providing the building industry with flexible design tools for determining building energy compliance."
Elena Schmid, Manager, Building and Appliance Efficiency Office
California Energy Commission

"We used several other software packages . . . but not one of the companies give the in-depth assistance which we find at Enercomp. Your knowledge of your product and its application is excellent. I don't believe we ever called you with a question which you didn't answer."
Darrel Kelly, Builders Energy Services, Gilroy, CA

"As a person who does a high volume of compliance business, and one who wants a top quality product, I personally use MICROPAS . . . For the money you get all the Title-24 help you can handle . . . It would be hard to go wrong purchasing this product."
Don Hughes, Energy Design Consulting, La Jolla, CA

EASY TO USE

- Menu driven software with clear prompts and extensive error checking.
- Interactive data entry functions similar to a spreadsheet program.
- MICROPAS calculations are easier to plan check because the compliance printouts are clear and understandable -- yielding a faster turn-around at the building department.

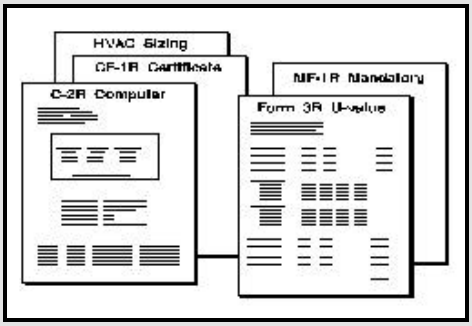
TIME SAVING FEATURES

- Optimization reduces the number of calculations by up to a *factor of 16* compared to other software packages.
- In most cases, all compliance documentation is generated by MICROPAS, no hand calculations are required.
- Both *Computer Performance* and *HVAC Sizing* calculations are performed automatically.
- Compliance results for building design changes are available in seconds.
- Multiple-orientation analysis for *production housing* is performed automatically and summarized on a single printout.
- *Multiple-run* feature allows you to run from a few to a few hundred building compliance calculations at a time. It stores the results and lets you select those which meet your compliance criteria.
- *Building Additions Worksheet* calculates compliance from two MICROPAS runs and summarizes it on a single printout.

MICROPAS . . . a Brief Overview

COMPLETE COMPLIANCE DOCUMENTATION

MICROPAS automatically generates all the compliance forms you need to complete your compliance submittal.



PROFESSIONAL COMPLIANCE FEATURES

MICROPAS has the most complete and the most flexible set of compliance features on the market. This optimizes your compliance efforts and ensures that you have the tools for flexible, cost-effective building designs.

- ✓ ***Computer Performance Method***
- ✓ ***HVAC Sizing Calculations***
- ✓ ***Production Housing***
- ✓ ***Building Additions***
- ✓ ***Complex Water Heating Systems***
- ✓ ***Database for managing results***

USER SUPPORT

Enercomp provides the best user support in the business -- complete documentation, regular updates, the most advanced compliance features, unsurpassed technical phone support . . . all part of the MICROPAS package.

☎ 1-800-755-5908

MONEY-BACK GUARANTEE!

We guarantee your satisfaction. If you are not fully satisfied with the MICROPAS package, return the product within 45 days and Enercomp will refund the entire purchase price.

SOME OF OUR THOUSANDS OF USERS

ENERGY CONSULTANTS
Consulting, construction, and manufacturing companies throughout California and the U.S.

UTILITIES
Pacific Gas and Electric Company, Pacific Power & Light, Sacramento Municipal Utility District, San Diego Gas and Electric, Southern California Edison, Southern California Gas Company.

BUILDING DEPARTMENTS
Over one hundred city and county building departments are using the MICROPAS program and the *MICROPAS Compliance Manual* to verify compliance submittals throughout the state of California.

ENERGY FEATURES

- Building surfaces: walls, doors ceilings, floors, windows, skylights, etc.
- Window shading: overhangs, side fins, shade screens.
- Thermal mass: slab floors, fireplaces, tile, mass walls.
- HVAC equipment efficiencies.
- Natural ventilation.
- Water Heating: gas, electric and heat pump; single systems or complex, multiple heater systems.

Special Energy Features:

- House Wrap.
- Radiant Barriers and Cool Roofs.
- Reduced Air Infiltration measures.
- Tested Duct Leakage.
- Reduced Duct Surface Area.
- Duct Design Credit.
- Refrigerant Charge and Airflow.
- Thermostatic Expansion Valves.
- Building Additions.
- Production Housing (subdivisions).
- Multiple-zone buildings.
- Zonally controlled HVAC systems.
- Controlled Ventilation Crawlspaces
- Hydronic Space and water heating systems.
- Sunspaces, atriums.

HVAC SIZING CALCULATIONS

The MICROPAS package includes calculations to determine the design loads for sizing heating and cooling equipment.

- Based on ASHRAE Cooling and Heating Load Calculation Manual.
- HVAC sizing calculations can be performed separately or as part of the MICROPAS run.
- Includes ASHRAE design temperatures for *all California* locations. Custom design conditions can be added by the user.

ADVANCED FEATURES

Multiple runs:
MICROPAS can run up to 1,000 runs at a time unattended (during break, lunch, etc.)

Database of Run Results:
You can better manage your Tittle-24 jobs by using the MICROPAS database. This feature automatically stores the results of each calculation and then lets you selectively printout whichever jobs and reports are needed. This database makes complex jobs and a busy compliance office much easier to manage.

Parametric Run Generator:
This option gives your the power to efficiently perform analyses that involve a large number of MICROPAS runs. First, you input one or more buildings, and then specify which variations you wish to make on those buildings. MICROPAS will automatically generate and calculate each building variation (up to 1,000 at a time).

Optional: Research Version:
The Research Version of MICROPAS *unlocks* a variety of input values that are normally constrained for California Title-24 compliance work. This version allows you to do analyses for out-of-state locations (weather data is available) and for any analyses which requires non-Title-24 assumptions.

Optional: C-HERS Version:
The C-HERS (California Home Energy Rating System) Version of MICROPAS is used to determine if a home meets Energy Star criteria set by the U.S. Environmental Protection Agency. This version is used in conjunction with the CHEERS (California Home Energy Efficiency Rating System) HERS rating program and is used in many utility incentive programs.

HARDWARE REQUIREMENTS

Personal Computers: Requires Windows 3.1/95/98/ME/NT/2000 or DOS, 640k of memory and a hard disk. Works with any printer.

Macintosh Computers: Compatibility with the Macintosh is accomplished using a software emulation product which essentially turns your Macintosh into a PC running Windows.

PACKAGE INCLUDES

- MICROPAS Program Disk.
- Sample building data.
- Weather data for all 16 California Climate Zones.
- MICROPAS User Manual
- One year of toll-free technical phone support.
- One year of free software updates.
- 45-day Money-back Guarantee.

Call us at 800-755-5908

ENERCOMP, Inc.

1721 Arroyo Drive ▪ Auburn, CA 95603 ▪ 800-755-5908 ▪ fax 530-885-9892 ▪ www.micropas.com

MICROPAS6

Compliance Report Overview

The reporting capabilities of MICROPAS provide you with the proper compliance documentation for nearly all compliance situations -- eliminating hand calculations, making the most of your time, and speeding the plan checking process by providing clear, complete and concise reports.

This document describes many of the MICROPAS compliance reports including:

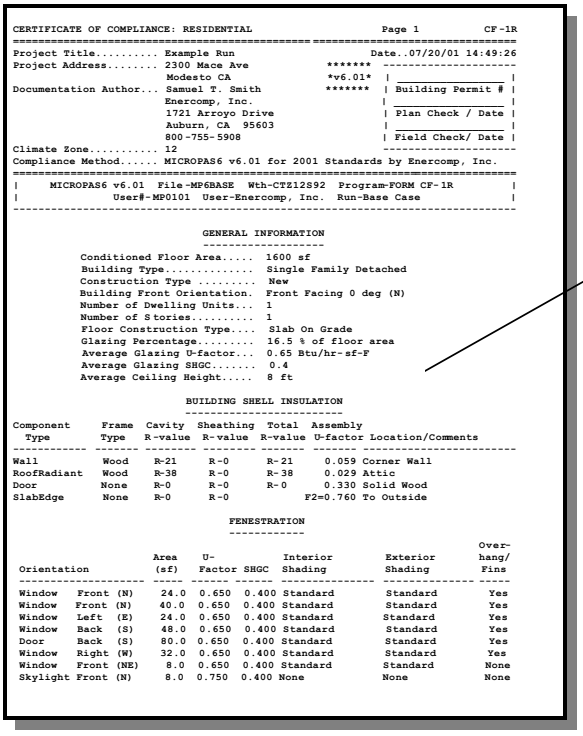
- CF-1R Certificate of Compliance
- C-2R Computer Performance Summary
- Form 3R Construction Assembly
- HVAC Sizing Calculations
- Production Housing C-2R Summary
- Building Additions/Alterations Worksheet

Another compliance report available with MICROPAS (but not shown here) is:

- MF-1R Mandatory Features Checklist (a required features checklist for plan checking).

CF-1R Report: Certificate Of Compliance

The CF-1R Report lists the energy features of the building in general terms. It provides useful design information for the designer and builder, and is checked by the building department during the field inspection. The CF-1R Report must be signed by the appropriate parties and attached to the building plans.



CERTIFICATE OF COMPLIANCE: RESIDENTIAL Page 1 CF-1R

Project Title..... Example Run Date..07/20/01 14:49:26
Project Address..... 2300 Mace Ave *******
Modesto CA *v6.01*
Documentation Author... Samuel T. Smith *******
Enercomp, Inc.
1721 Arroyo Drive
Auburn, CA 95603
800-755-5908
Climate Zone..... 12
Compliance Method..... MICROPAS6 v6.01 for 2001 Standards by Enercomp, Inc.

Building Permit #
Plan Check / Date
Field Check/ Date

MICROPAS6 v6.01 File-MP6BASE Wth-CTZ12S92 Program-FORM CF-1R
User#-MP0101 User-Enercomp, Inc. Run-Base Case

GENERAL INFORMATION

Conditioned Floor Area..... 1600 sf
Building Type..... Single Family Detached
Construction Type ..... New
Building Front Orientation. Front Facing 0 deg (N)
Number of Dwelling Units... 1
Number of Stories..... 1
Floor Construction Type.... Slab On Grade
Glazing Percentage..... 16.5 % of floor area
Average Glazing U-factor... 0.65 Btu/hr-sf-F
Average Glazing SHGC..... 0.4
Average Ceiling Height..... 8 ft

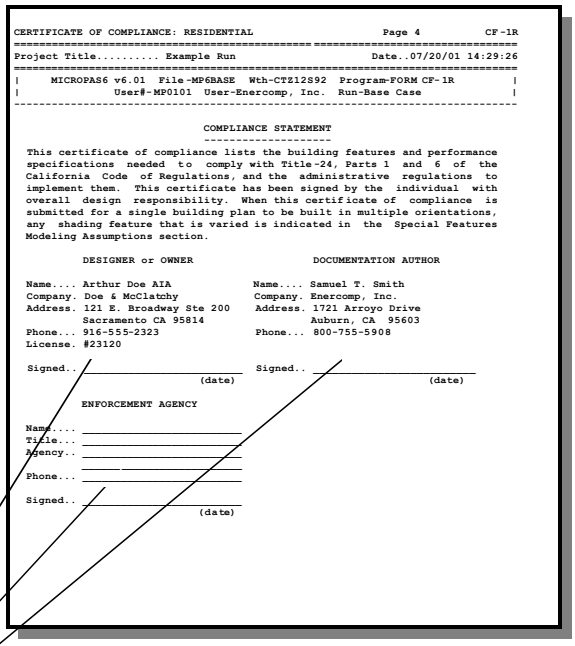
BUILDING SHELL INSULATION

Component	Frame Type	Cavity R-value	Sheathing R-value	Total R-value	Assembly U-factor	Location/Comments
Wall	Wood	R-21	R-0	R-21	0.059	Corner Wall
RoofRadiant	Wood	R-38	R-0	R-38	0.029	Attic
Door	None	R-0	R-0	R-0	0.330	Solid Wood
SlabEdge	None	R-0	R-0		F2=0.760	To Outside

FENESTRATION

Orientation	Area (sf)	U-Factor	SHGC	Interior Shading	Exterior Shading	Over-hang/ Fins
Window Front (N)	24.0	0.650	0.400	Standard	Standard	Yes
Window Front (N)	40.0	0.650	0.400	Standard	Standard	Yes
Window Left (E)	24.0	0.650	0.400	Standard	Standard	Yes
Window Back (S)	48.0	0.650	0.400	Standard	Standard	Yes
Door Back (S)	80.0	0.650	0.400	Standard	Standard	Yes
Window Right (W)	32.0	0.650	0.400	Standard	Standard	Yes
Window Front (NE)	8.0	0.650	0.400	Standard	Standard	None
Skylight Front (N)	8.0	0.750	0.400	None	None	None

General Building Energy Data



CERTIFICATE OF COMPLIANCE: RESIDENTIAL Page 4 CF-1R

Project Title..... Example Run Date..07/20/01 14:29:26

MICROPAS6 v6.01 File-MP6BASE Wth-CTZ12S92 Program-FORM CF-1R
User#-MP0101 User-Enercomp, Inc. Run-Base Case

COMPLIANCE STATEMENT

This certificate of compliance lists the building features and performance specifications needed to comply with Title-24, Parts 1 and 6 of the California Code of Regulations, and the administrative regulations to implement them. This certificate has been signed by the individual with overall design responsibility. When this certificate of compliance is submitted for a single building plan to be built in multiple orientations, any shading feature that is varied is indicated in the Special Features Modeling Assumptions section.

DESIGNER or OWNER

Name.... Arthur Doe AIA
Company. Doe & McClatchy
Address. 121 E. Broadway Ste 200
Sacramento CA 95814
Phone... 916-555-2323
License. #23120

Signed.. _____ (date)

DOCUMENTATION AUTHOR

Name.... Samuel T. Smith
Company. Enercomp, Inc.
Address. 1721 Arroyo Drive
Auburn, CA 95603
Phone... 800-755-5908

Signed.. _____ (date)

ENFORCEMENT AGENCY

Name.... _____
Title... _____
Agency.. _____
_____
Phone... _____

Signed.. _____ (date)

Signatures of designer or owner, documentation preparer and plan checker

ENERCOMP, Inc.

1721 Arroyo Drive ▪ Auburn, CA 95603 ▪ 800-755-5908 ▪ fax 530-885-9892 ▪ www.micropas.com

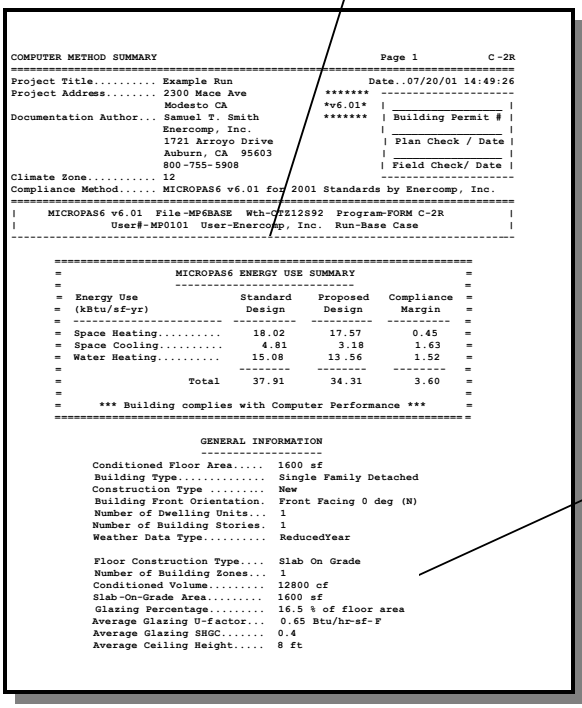
C-2R Report: Computer Performance Summary

The C-2R Report shows if the proposed building design complies with the *Computer Performance Method* of compliance. This MICROPAS report also provides a detailed list of the energy related building data used for the analysis. This data is verified by the building department during plan check.

Compliance Results (*Computer Performance*)

Detailed Building Data

Special Features and HERS Verification messages



COMPUTER METHOD SUMMARY — Page 1 — C-2R

Project Title..... Example Run — Date..07/20/01 14:49:26
Project Address..... 2300 Mace Ave — *******
Modesto CA — *v6.01*
Documentation Author... Samuel T. Smith — *******
Enercomp, Inc.
1721 Arroyo Drive
Auburn, CA 95603
800-755-5908
Climate Zone..... 12
Compliance Method..... MICROPAS6 v6.01 for 2001 Standards by Enercomp, Inc.

Building Permit # | Plan Check / Date | Field Check/ Date

MICROPAS6 v6.01 File-MP6BASE Wth-CTZ12S92 Program-FORM C-2R
User#-MP0101 User-Enercomp, Inc. Run-Base Case

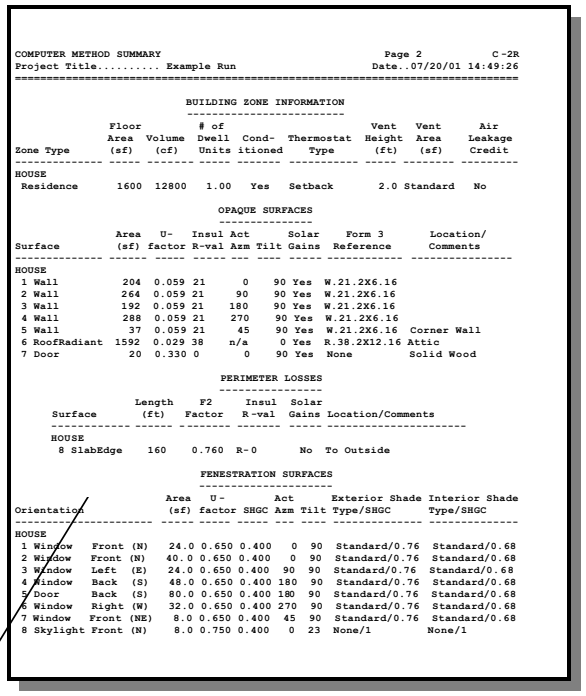
MICROPAS6 ENERGY USE SUMMARY

Energy Use (kBtu/sf-yr)	Standard Design	Proposed Design	Compliance Margin
Space Heating	18.02	17.57	0.45
Space Cooling	4.81	3.18	1.63
Water Heating	15.08	13.56	1.52
Total	37.91	34.31	3.60

*** Building complies with Computer Performance ***

GENERAL INFORMATION

Conditioned Floor Area	1600 sf
Building Type	Single Family Detached
Construction Type	New
Building Front Orientation	Front Facing 0 deg (N)
Number of Dwelling Units	1
Number of Building Stories	1
Weather Data Type	ReducedYear
Floor Construction Type	Slab On Grade
Number of Building Zones	1
Conditioned Volume	12800 cf
Slab-On-Grade Area	1600 sf
Glazing Percentage	16.5 % of floor area
Average Glazing U-factor	0.65 Btu/hr-sf-F
Average Glazing SHGC	0.4
Average Ceiling Height	8 ft



COMPUTER METHOD SUMMARY — Page 2 — C-2R
Project Title..... Example Run — Date..07/20/01 14:49:26

BUILDING ZONE INFORMATION

Zone Type	Floor Area (sf)	Volume (cf)	# of Dwell Units	Cond-itioned	Thermostat Type	Vent Height (ft)	Vent Area (sf)	Air Leakage Credit
HOUSE								
Residence	1600	12800	1.00	Yes	Setback	2.0	Standard	No

OPAQUE SURFACES

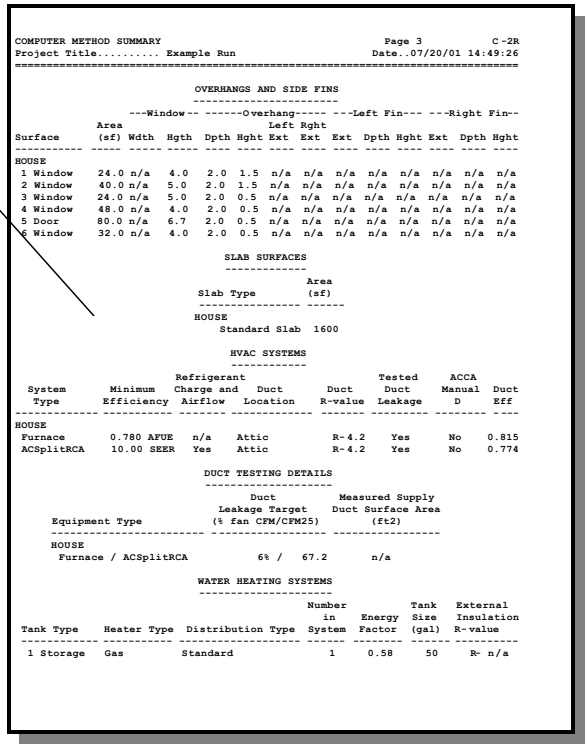
Surface	Area (sf)	U-factor	Insul R-val	Act Azm	Tilt	Solar Gains	Form 3 Reference	Location/ Comments
HOUSE								
1 Wall	204	0.059	21	0	90	Yes	W.21.2X6.16	
2 Wall	264	0.059	21	90	90	Yes	W.21.2X6.16	
3 Wall	192	0.059	21	180	90	Yes	W.21.2X6.16	
4 Wall	288	0.059	21	270	90	Yes	W.21.2X6.16	
5 Wall	37	0.059	21	45	90	Yes	W.21.2X6.16	Corner Wall
6 RoofRadiant	1592	0.029	38	n/a	0	Yes	R.38.2X12.16	Attic
7 Door	20	0.330	0	0	90	Yes	None	Solid Wood

PERIMETER LOSSES

Surface	Length (ft)	F2 Factor	Insul R-val	Solar Gains	Location/Comments
HOUSE					
8 SlabEdge	160	0.760	R-0	No	To Outside

FENESTRATION SURFACES

Orientation	Area (sf)	U-factor	SHGC	Act Azm	Tilt	Exterior Shade Type/SHGC	Interior Shade Type/SHGC
HOUSE							
1 Window Front (N)	24.0	0.650	0.400	0	90	Standard/0.76	Standard/0.68
2 Window Front (N)	40.0	0.650	0.400	0	90	Standard/0.76	Standard/0.68
3 Window Left (E)	24.0	0.650	0.400	90	90	Standard/0.76	Standard/0.68
4 Window Back (S)	48.0	0.650	0.400	180	90	Standard/0.76	Standard/0.68
5 Door Back (S)	80.0	0.650	0.400	180	90	Standard/0.76	Standard/0.68
6 Window Right (W)	32.0	0.650	0.400	270	90	Standard/0.76	Standard/0.68
7 Window Front (NE)	8.0	0.650	0.400	45	90	Standard/0.76	Standard/0.68
8 Skylight Front (N)	8.0	0.750	0.400	0	23	None/1	None/1



COMPUTER METHOD SUMMARY — Page 3 — C-2R
Project Title..... Example Run — Date..07/20/01 14:49:26

OVERHANGS AND SIDE FINS

Surface	Area (sf)	Window Wdth	Hgth	Overhang Dpth	Hgt	Left Fin Ext	Ext	Ext	Dpth	Hgt	Right Fin Ext	Ext	Dpth	Hgt
HOUSE														
1 Window	24.0	n/a	4.0	2.0	1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2 Window	40.0	n/a	5.0	2.0	1.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
3 Window	24.0	n/a	5.0	2.0	0.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
4 Window	48.0	n/a	4.0	2.0	0.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
5 Door	80.0	n/a	6.7	2.0	0.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
6 Window	32.0	n/a	4.0	2.0	0.5	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

SLAB SURFACES

Slab Type	Area (sf)
HOUSE	
Standard Slab	1600

HVAC SYSTEMS

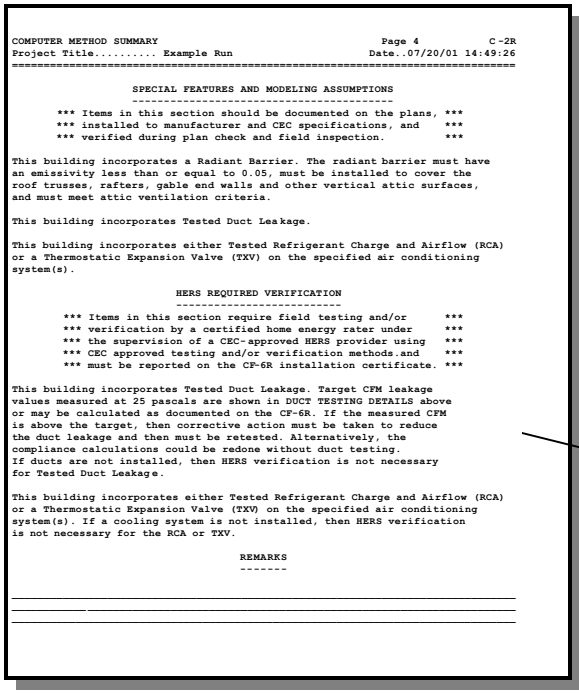
System Type	Minimum Efficiency	Refrigerant Charge and Airflow	Duct Location	Duct R-value	Tested Duct Leakage	ACCA Manual D	Duct Eff
HOUSE							
Furnace	0.780 AFUE	n/a	Attic	R-4.2	Yes	No	0.815
ACSplitRCA	10.00 SEER	Yes	Attic	R-4.2	Yes	No	0.774

DUCT TESTING DETAILS

Equipment Type	Duct Leakage Target (% fan CFM/CFM25)	Measured Supply Duct Surface Area (ft2)
HOUSE		
Furnace / ACSplitRCA	6% / 67.2	n/a

WATER HEATING SYSTEMS

Tank Type	Heater Type	Distribution Type	Number in System	Energy Factor	Tank Size (gal)	External Insulation R-value
1 Storage	Gas	Standard	1	0.58	50	R- n/a



COMPUTER METHOD SUMMARY — Page 4 — C-2R
Project Title..... Example Run — Date..07/20/01 14:49:26

SPECIAL FEATURES AND MODELING ASSUMPTIONS

*** Items in this section should be documented on the plans, ***
*** installed to manufacturer and CEC specifications, and ***
*** verified during plan check and field inspection. ***

This building incorporates a Radiant Barrier. The radiant barrier must have an emissivity less than or equal to 0.05, must be installed to cover the roof trusses, rafters, gable end walls and other vertical attic surfaces, and must meet attic ventilation criteria.

This building incorporates Tested Duct Leakage.

This building incorporates either Tested Refrigerant Charge and Airflow (RCA) or a Thermostatic Expansion Valve (TXV) on the specified air conditioning system(s).

HERS REQUIRED VERIFICATION

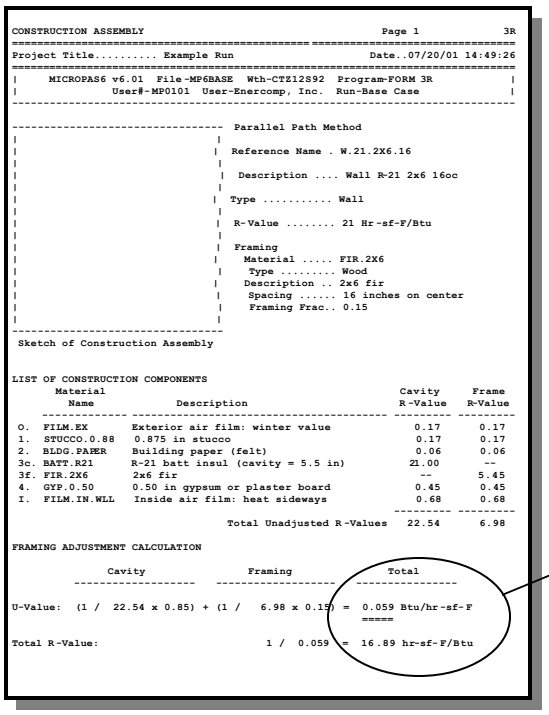
*** Items in this section require field testing and/or ***
*** verification by a certified home energy rater under ***
*** the supervision of a CEC-approved HERS provider using ***
*** CEC approved testing and/or verification methods.and ***
*** must be reported on the CF-6R installation certificate. ***

This building incorporates Tested Duct Leakage. Target CFM leakage values measured at 25 pascals are shown in DUCT TESTING DETAILS above or may be calculated as documented on the CF-6R. If the measured CFM is above the target, then corrective action must be taken to reduce the duct leakage and then must be retested. Alternatively, the compliance calculations could be redone without duct testing. If ducts are not installed, then HERS verification is not necessary for Tested Duct Leakage.

This building incorporates either Tested Refrigerant Charge and Airflow (RCA) or a Thermostatic Expansion Valve (TXV) on the specified air conditioning system(s). If a cooling system is not installed, then HERS verification is not necessary for the RCA or TXV.

REMARKS

3R: Construction Assembly



```
CONSTRUCTION ASSEMBLY                                        Page 1          3R
================================================================================
Project Title..... Example Run                          Date..07/20/01 14:49:26
================================================================================
|     MICROPAS6 v6.01  File-MP6BASE  Wth-CTZ12S92  Program-FORM 3R             |
|              User#-MP0101  User-Enercomp, Inc.  Run-Base Case                |
--------------------------------------------------------------------------------

---------------------------------  Parallel Path Method
|                                |
|                               |  Reference Name . W.21.2X6.16
|                               |
|                                |  Description .... Wall R-21 2x6 16oc
|                                |
|                               |  Type ........... Wall
|                               |
|                               |  R-Value ........ 21 Hr-sf-F/Btu
|                               |
|                               |  Framing
|                               |    Material ..... FIR.2X6
|                               |     Type ......... Wood
|                               |    Description .. 2x6 fir
|                               |     Spacing ...... 16 inches on center
|                               |     Framing Frac.. 0.15
|                               |
---------------------------------
 Sketch of Construction Assembly


LIST OF CONSTRUCTION COMPONENTS
       Material                                                  Cavity     Frame
         Name            Description                           R-Value   R-Value
    ---------- ---------------------------------------------- --------- ---------
 0.  FILM.EX       Exterior air film: winter value                0.17      0.17
 1.  STUCCO.0.88   0.875 in stucco                               0.17      0.17
 2.  BLDG.PAPER    Building paper (felt)                          0.06      0.06
 3c. BATT.R21      R-21 batt insul (cavity = 5.5 in)             21.00       --
 3f. FIR.2X6       2x6 fir                                         --      5.45
 4.  GYP.0.50      0.50 in gypsum or plaster board                0.45      0.45
 I.  FILM.IN.WLL   Inside air film: heat sideways                 0.68      0.68
                                                                --------- ---------
                                  Total Unadjusted R-Values     22.54      6.98

FRAMING ADJUSTMENT CALCULATION

                Cavity               Framing              Total
              ----------           ----------           ----------

U-Value:  (1 /  22.54 x 0.85) + (1 /   6.98 x 0.15) =  0.059 Btu/hr-sf-F
                                                       =====

Total R-Value:                          1 /  0.059 =  16.89 hr-sf-F/Btu
```

MICROPAS lists the Construction Assemblies used to calculate wood or metal frame U-values for roofs, floors and walls.

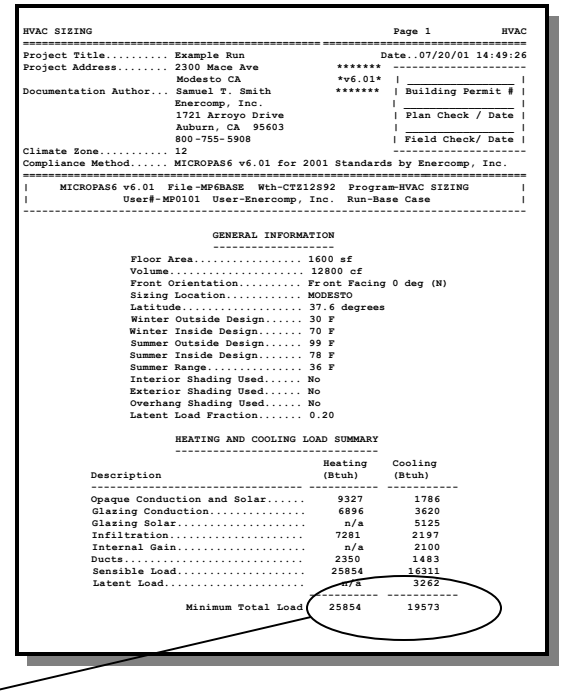
The page on the left is a sample of a wood frame wall construction assembly. Each construction assembly used in a building can be printed as part of the compliance report submittal for plan check verification.

Overall Assembly U-value and R-value

HVAC Sizing Report

The MICROPAS HVAC Sizing Report shows the design loads for the heating and cooling equipment. These loads are one of the criteria used to select HVAC equipment.

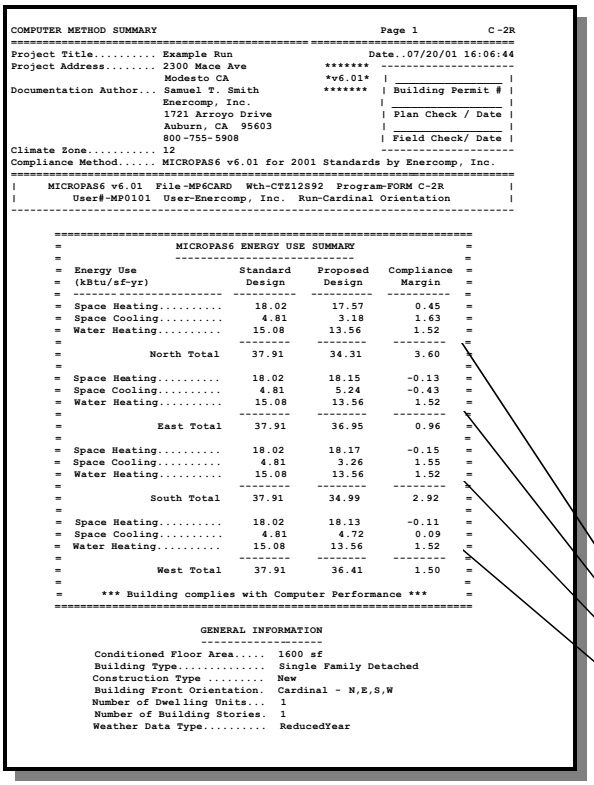
The report shown at the right is a summary page. Detailed reports of the load calculations are also available.



```
HVAC SIZING                                                  Page 1          HVAC
================================================================================
Project Title..... Example Run                          Date..07/20/01 14:49:26
Project Address..... 2300 Mace Ave              *******  ----------------------
                     Modesto CA                 *v6.01*  | _________________ |
Documentation Author... Samuel T. Smith         *******  | Building Permit # |
                     Enercomp, Inc.                      | _________________ |
                     1721 Arroyo Drive                   | Plan Check / Date |
                     Auburn, CA  95603                   | _________________ |
                     800-755-5908                        | Field Check/ Date |
Climate Zone..... 12                                     ----------------------
Compliance Method..... MICROPAS6 v6.01 for 2001 Standards by Enercomp, Inc.
================================================================================
|     MICROPAS6 v6.01  File-MP6BASE  Wth-CTZ12S92  Program-HVAC SIZING          |
|              User#-MP0101  User-Enercomp, Inc.  Run-Base Case                |
--------------------------------------------------------------------------------

                          GENERAL INFORMATION
                          -------------------

                Floor Area..................... 1600 sf
                Volume......................... 12800 cf
                Front Orientation.............. Front Facing 0 deg (N)
                Sizing Location................ MODESTO
                Latitude....................... 37.6 degrees
                Winter Outside Design.......... 30 F
                Winter Inside Design........... 70 F
                Summer Outside Design.......... 99 F
                Summer Inside Design........... 78 F
                Summer Range................... 36 F
                Interior Shading Used.......... No
                Exterior Shading Used.......... No
                Overhang Shading Used.......... No
                Latent Load Fraction........... 0.20

                      HEATING AND COOLING LOAD SUMMARY
                      --------------------------------

                                                    Heating     Cooling
          Description                               (Btuh)      (Btuh)
          ----------------------------------------- ----------  ----------
          Opaque Conduction and Solar.....           9327        1786
          Glazing Conduction..............           6896        3620
          Glazing Solar...................            n/a        5125
          Infiltration....................           7281        2197
          Internal Gain...................            n/a        2100
          Ducts...........................           2350        1483
          Sensible Load...................          25854       16311
          Latent Load.....................            n/a        3262
                                                    ----------  ----------
                        Minimum Total Load          25854       19573
```

Design Loads

Production Housing Worksheet



```
COMPUTER METHOD SUMMARY                                    Page 1          C-2R
Project Title..... Example Run                          Date..07/20/01 16:06:44
Project Address..... 2300 Mace Ave            *******  ---------------------
                      Modesto CA              *v6.01*  |                     |
Documentation Author... Samuel T. Smith       *******  | Building Permit #   |
                      Enercomp, Inc.                   |                     |
                      1721 Arroyo Drive                | Plan Check / Date   |
                      Auburn, CA  95603                |                     |
                      800-755-5908                     | Field Check/ Date   |
Climate Zone..... 12                                   ---------------------
Compliance Method..... MICROPAS6 v6.01 for 2001 Standards by Enercomp, Inc.
|    MICROPAS6 v6.01  File-MP6CARD  Wth-CTZ12S92  Program-FORM C-2R          |
|        User#-MP0101  User-Enercomp, Inc.  Run-Cardinal Orientation         |

                    MICROPAS6 ENERGY USE SUMMARY
  Energy Use                Standard    Proposed   Compliance
  (kBtu/sf-yr)               Design      Design     Margin
  Space Heating.....          18.02       17.57       0.45
  Space Cooling.....           4.81        3.18       1.63
  Water Heating.....          15.08       13.56       1.52
              North Total     37.91       34.31       3.60
  Space Heating.....          18.02       18.15      -0.13
  Space Cooling.....           4.81        5.24      -0.43
  Water Heating.....          15.08       13.56       1.52
              East Total      37.91       36.95       0.96
  Space Heating.....          18.02       18.17      -0.15
  Space Cooling.....           4.81        3.26       1.55
  Water Heating.....          15.08       13.56       1.52
              South Total     37.91       34.99       2.92
  Space Heating.....          18.02       18.13      -0.11
  Space Cooling.....           4.81        4.72       0.09
  Water Heating.....          15.08       13.56       1.52
              West Total      37.91       36.41       1.50
    *** Building complies with Computer Performance ***

                        GENERAL INFORMATION
      Conditioned Floor Area.....  1600 sf
      Building Type.............   Single Family Detached
      Construction Type .......    New
      Building Front Orientation.  Cardinal - N,E,S,W
      Number of Dwelling Units...  1
      Number of Building Stories.  1
      Weather Data Type.........   ReducedYear
```

MICROPAS has the powerful capability of analyzing compliance for production housing (subdivisions).

Production house design (one which can be built in any compass orientation) must be shown to comply in the four cardinal orientations (north, south, east and west). MICROPAS automatically performs calculations for each of these orientations and then summarizes the compliance results on a single C-2R page (as shown on the left).

This feature lets you use only one building data file and thus saves you the hassle of maintaining four files as the building design is finalized. The reports generated by this feature are one-fourth as many pages and provides a single place for verification by the building department.

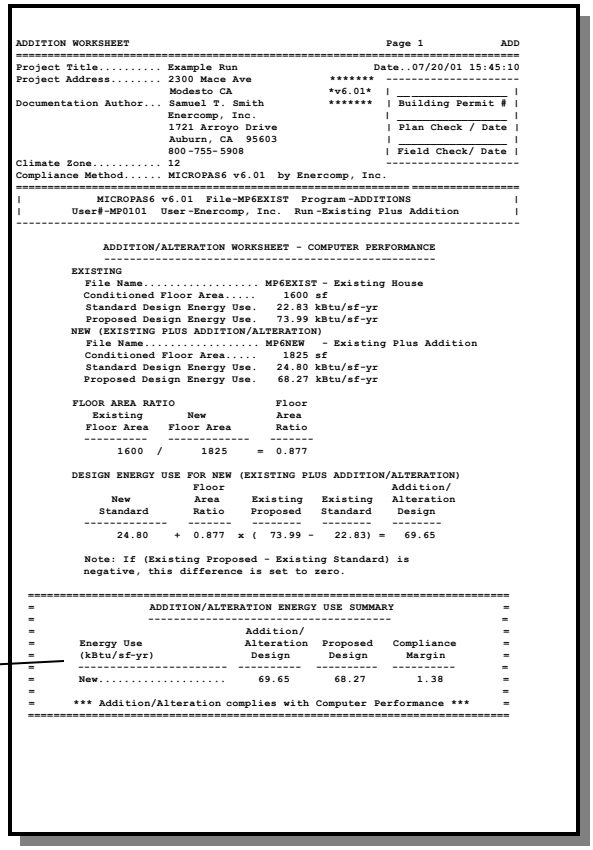
Compliance Results for all four cardinal orientations

Building Additions/ Alterations Worksheet

The MICROPAS Building Additions/Alterations Worksheet simplifies analysis of building additions or alterations using the “existing plus ...” compliance approach by combining the results of the two required MICROPAS runs:d

Run #1: the building before the addition or alteration
Run #2: the building after the addition or alteration

Compliance is calculated from the results of the two runs. This report eliminates tedious hand calculations and provides a clear set of documentation to speed the plan checking process.



```
ADDITION WORKSHEET                                         Page 1            ADD
Project Title..... Example Run                          Date..07/20/01 15:45:10
Project Address..... 2300 Mace Ave            *******  ---------------------
                      Modesto CA              *v6.01*  |                     |
Documentation Author... Samuel T. Smith       *******  | Building Permit #   |
                      Enercomp, Inc.                   |                     |
                      1721 Arroyo Drive                | Plan Check / Date   |
                      Auburn, CA  95603                |                     |
                      800-755-5908                     | Field Check/ Date   |
Climate Zone..... 12                                   ---------------------
Compliance Method..... MICROPAS6 v6.01  by Enercomp, Inc.
|          MICROPAS6 v6.01  File-MP6EXIST  Program-ADDITIONS                 |
|        User#-MP0101  User-Enercomp, Inc.  Run-Existing Plus Addition       |

          ADDITION/ALTERATION WORKSHEET - COMPUTER PERFORMANCE
      EXISTING
        File Name.................. MP6EXIST - Existing House
        Conditioned Floor Area.....     1600 sf
        Standard Design Energy Use.    22.83 kBtu/sf-yr
        Proposed Design Energy Use.    73.99 kBtu/sf-yr
      NEW (EXISTING PLUS ADDITION/ALTERATION)
        File Name.................. MP6NEW   - Existing Plus Addition
        Conditioned Floor Area.....     1825 sf
        Standard Design Energy Use.    24.80 kBtu/sf-yr
        Proposed Design Energy Use.    68.27 kBtu/sf-yr

      FLOOR AREA RATIO                  Floor
         Existing       New             Area
        Floor Area   Floor Area         Ratio
        ----------   ----------       --------
            1600  /      1825     =    0.877

      DESIGN ENERGY USE FOR NEW (EXISTING PLUS ADDITION/ALTERATION)
                          Floor                              Addition/
            New           Area      Existing   Existing     Alteration
         Standard         Ratio     Proposed   Standard      Design
        ----------      --------    --------   --------    --------
            24.80    +    0.877  x (  73.99 -    22.83) =     69.65

        Note: If (Existing Proposed - Existing Standard) is
        negative, this difference is set to zero.

                ADDITION/ALTERATION ENERGY USE SUMMARY
                                        Addition/
        Energy Use                     Alteration   Proposed    Compliance
        (kBtu/sf-yr)                    Design       Design      Margin
        New.....................        69.65        68.27        1.38
      *** Addition/Alteration complies with Computer Performance ***
```

Building Addition Compliance Result

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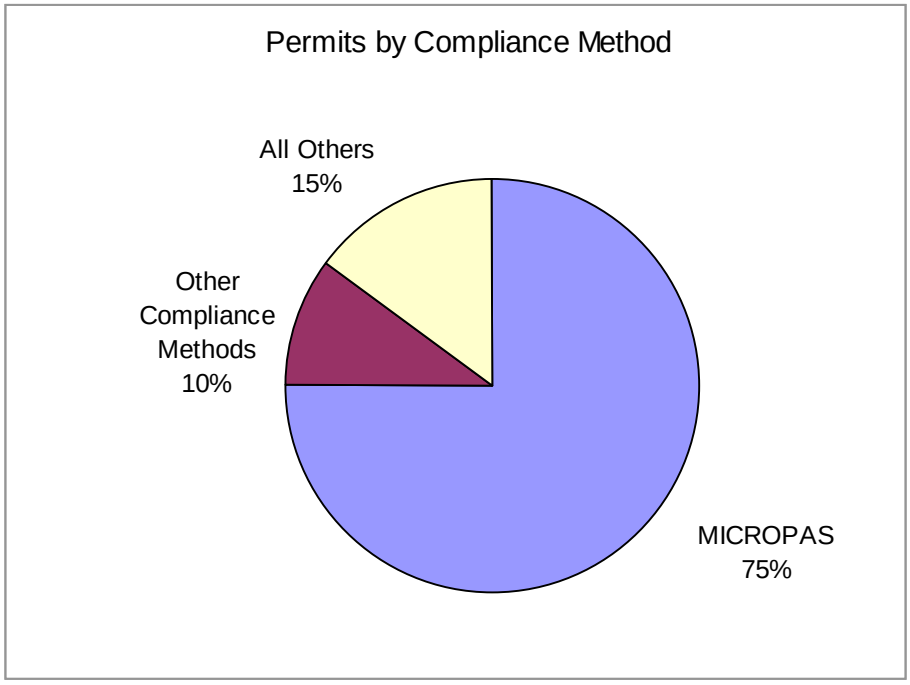
In the most recent study of the Residential Field Data Project, the California Energy Commission reports that in a survey of 1230 homes in climate zones 10, 12, 13 and 14 that **MICROPAS** runs account for about **75%** of the submittals studied.



Why would you want to use anything else?

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Tom Rotchford, P.E.
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Energy Compliance Systems, San Jose

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